CALIFORNIA HIGH-SPEED TRAIN

Program Environmental Impact Report/Environmental Impact Statement

Bakersfield to Los Angeles

HYDROLOGY & WATER QUALITY TECHNICAL EVALUATION

January 2004

Prepared for:

California High-Speed Rail Authority

U.S. Department of Transportation
Federal Railroad Administration

CALIFORNIA HIGH SPEED RAIL AUTHORITY

U.S. Department of Transportation
Federal Railroad Administration

CALIFORNIA HIGH-SPEED TRAIN PROGRAM EIR/EIS

Bakersfield to Los Angeles Hydrology & Water Quality Technical Evaluation

Prepared by:

P&D Consultants

January 2004

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

ACRONYMS

AUTHORITY	CALIFORNIA HIGH-SPEED RAIL AUTHORITY
ACOE	U.S. ARMY CORPS OF ENGINEERS
CDFG	CALIFORNIA DEPARTMENT OF FISH AND GAME
CEQA	CALIFORNIA ENVIRONMENTAL QUALITY ACT
COG	COUNCIL OF GOVERNMENTS
CVWQCB	CENTRAL VALLEY WATER QUALITY CONTROL BOARD
CWA	CLEAN WATER ACT
CZARA	COSTAL ZONE ACT REAUTHORIZATION AMENDMENTS
BMP	BEST MANAGEMENT PRACTICE
DLG	DIGITAL LINE GRAPH
DOT	U.S. DEPARTMENT OF TRANSPORTATION
EIR	ENVIRONMENTAL IMPACT REPORT
EIS	ENVIRONMENTAL IMPACT STATEMENT
EPA	ENVIRONMENTAL PROTECTION AGENCY
FAA	FEDERAL AVIATION ADMINISTRATION
FEMA	FEDERAL EMERGENCY MANAGEMENT ACT
FHWA	FEDERAL HIGHWAY ADMINISTRATION
FIRM	FEDERAL INSURANCE RATE MAP
FRA	FEDERAL RAILROAD ADMINISTRATION
FTA	FEDERAL TRANSIT ADMINISTRATION
HSTA	HIGH-SPEED RAIL AUTHORITY
HST	HIGH-SPEED TRAIN
LAWQCB	Los Angels Water Quality Control Board
MTA	METROPOLITAN TRANSPORTATION AUTHORITY
NEPA	NATIONAL ENVIRONMENTAL POLICY ACT
NPDES	NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
RTP	REGIONAL TRANSPORTATION PLAN
RWQCB	REGIONAL WATER QUALITY CONTROL BOARD
SFHA	SPECIAL FLOOD HAZARD AREA
SUSMP	STANDARD URBAN STORM WATER MITIGATION PLAN
SWRCB	STATE WATER RESOURCES CONTROL BOARD
USGS	UNITED STATES GEOLOGICAL SURVEY

1.0 INTRODUCTION

The California High-Speed Rail Authority (Authority) was created by the Legislature in 1996 to develop a plan for the construction, operation, and financing of a statewide, intercity high-speed passenger train system.[1] After completing a number of initial studies over the past six years to assess the feasibility of a high-speed train system in California and to evaluate the potential ridership for a variety of alternative corridors and station areas, the Authority recommended the evaluation of a proposed high-speed train system as the logical next step in the development of California's transportation infrastructure. The Authority does not have responsibility for other intercity transportation systems or facilities, such as expanded highways, or improvements to airports or passenger rail or transit used for intercity trips.

The Authority adopted a *Final Business Plan* in June 2000, which reviewed the economic feasibility of a 1,127-kilometer-long (700-mile-long) high-speed train system. This system would be capable of speeds in excess of 321.8 kilometers per hour (200 miles per hour [mph]) on a dedicated, fully grade-separated track with state-of-the-art safety, signaling, and automated train control systems. The system described would connect and serve the major metropolitan areas of California, extending from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego. The high-speed train system is projected to carry a minimum of 42 million passengers annually (32 million intercity trips and 10 million commuter trips) by the year 2020.

Following the adoption of the Business Plan, the appropriate next step for the Authority to take in the pursuit of a high-speed train system is to satisfy the environmental review process required by federal and state laws which will in turn enable public agencies to select and approve a high speed rail system, define mitigation strategies, obtain necessary approvals, and obtain financial assistance necessary to implement a high speed rail system. For example, the Federal Railroad Administration (FRA) may be requested by the Authority to issue a *Rule of Particular Applicability*, which establishes safety standards for the high-speed train system for speeds over 200 mph, and for the potential shared use of rail corridors.

The Authority is both the project sponsor and the lead agency for purposes of the California Environmental Quality Act (CEQA) requirements. The Authority has determined that a Program Environmental Impact Report (EIR) is the appropriate CEQA document for the project at this conceptual stage of planning and decision-making, which would include selecting a preferred corridor and station locations for future right-of-way preservation and identifying potential phasing options. No permits are being sought for this phase of environmental review. Later stages of project development would include project-specific detailed environmental documents to assess the impacts of the alternative alignments and stations in those segments of the system that are ready for implementation.

The decisions of federal agencies, particularly the Federal Railroad Administration (FRA) related to high-speed train systems, would constitute major federal actions regarding environmental review under the National Environmental Policy Act (NEPA). NEPA requires federal agencies to prepare an Environmental Impact Statement (EIS) if the proposed action has the potential to cause significant environmental impacts. The proposed action in California warrants the preparation of a Tier 1 Program-level EIS under NEPA, due to the nature and scope of the comprehensive high-speed train system proposed by the Authority, the need to narrow the range of alternatives, and the need to protect/preserve right-of-way in the future. FRA is the federal lead agency for the preparation of the Program EIS, and the Federal Highway Administration (FHWA), the U.S. Environmental Protection Agency (EPA), the U.S. Corps of Engineers (USACE), the Federal Aviation Administration (FAA), the U.S. Fish and Wildlife Service (USFWS), and the Federal Transit Administration (FTA) are cooperating federal agencies for the EIS.

[1] Chapter 796 of the Statutes of 1996; SB 1420, Kopp and Costa

A combined Program EIR/EIS is to be prepared under the supervision and direction of the FRA and the Authority in conjunction with the federal cooperating agencies. It is intended that other federal, state, regional, and local agencies will use the Program EIR/EIS in reviewing the proposed program and developing feasible and practicable programmatic mitigation strategies and analysis expectations for the Tier 2 detailed environmental review process which would be expected to follow any approval of a high speed train system.

The statewide high-speed train system has been divided into five regions for study: Bay Area-Merced, Sacramento-Bakersfield, Bakersfield-Los Angeles, Los Angeles-San Diego via the Inland Empire, and Los Angeles-Orange County-San Diego. This Hydrology and Water Quality Technical Evaluation for the Bakersfield-Los Angeles Region is one of five such reports being prepared for each of the regions on the topic, and it is one of fifteen technical reports for this region. This report will be summarized in the Program EIR/EIS and it will be part of the administrative record supporting the environmental review of alternatives.

1.1 ALTERNATIVES (NO-PROJECT, MODAL, HST)

1.1.1 No-Project Alternative

The No-Project Alternative serves as the baseline for the comparison of Modal and High-Speed Train alternatives (Figure 1.2-1). The No-Project Alternative represents the state's transportation system (highway, air, and conventional rail) as it existed in 1999-2000 and as it would be after implementation of programs or projects currently programmed for implementation and projects that are expected to be funded by 2020. The No-Project Alternative addresses the geographic area serving the same intercity travel market as the proposed high-speed train (generally from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego). The No-Project Alternative satisfies the statutory requirements under CEQA and NEPA for an alternative that does not include any new action or project beyond what is already committed.

The No-Project Alternative defines the existing and future statewide intercity transportation system based on programmed and funded (already in funded programs/financially constrained plans) improvements to the intercity transportation system through 2020, according to the following sources of information:

- State Transportation Improvement Program (STIP)
- Regional Transportation Plans (RTPs) for all modes of travel
- Airport plans
- Intercity passenger rail plans (California Rail Plan 2001-2010, Amtrak Five- and Twenty-year Plans)

As with all of the alternatives, the No-Project Alternative will be assessed against the purpose and need topics/objectives for congestion, safety, air pollution, reliability, and travel times.

1.1.2 Modal Alternative

There are currently only three main options for intercity travel between the major urban areas of San Diego, Los Angeles, the Central Valley, San Jose, Oakland/San Francisco, and Sacramento: vehicles on the interstate highway system and state highways, commercial airlines serving airports between San Diego and Sacramento and the Bay Area, and conventional passenger trains (Amtrak) on freight and/or commuter rail tracks. The Modal/System Alternative consists of expansion of highways, airports, and intercity and commuter rail systems serving the markets identified for the High-Speed Train Alternative

(Figure 1.2-2 and 1.2-3). The Modal Alternative uses the same inter-city travel demand (not capacity) assumed under the high-end sensitivity analysis completed for the high-speed train ridership in 2020. This same travel demand is assigned to the highways and airports and passenger rail described under the No-Project Alternative, and the additional improvements or expansion of facilities is assumed to meet the demand, regardless of funding potential and without high-speed train service as part of the system.

1.1.3 High-Speed Train Alternative

The Authority has defined a statewide high-speed train system capable of speeds in excess of 200 miles per hour (mph) (320 kilometers per hour [km/h]) on dedicated, fully grade-separated tracks, with state-of-the-art safety, signaling, and automated train control systems. State of the art high-speed steel-wheel-on-steel-rail technology is being considered for the system that would serve the major metropolitan centers of California, extending from Sacramento and the San Francisco Bay Area, through the Central Valley, to Los Angeles and San Diego (Figure 1.2-4).

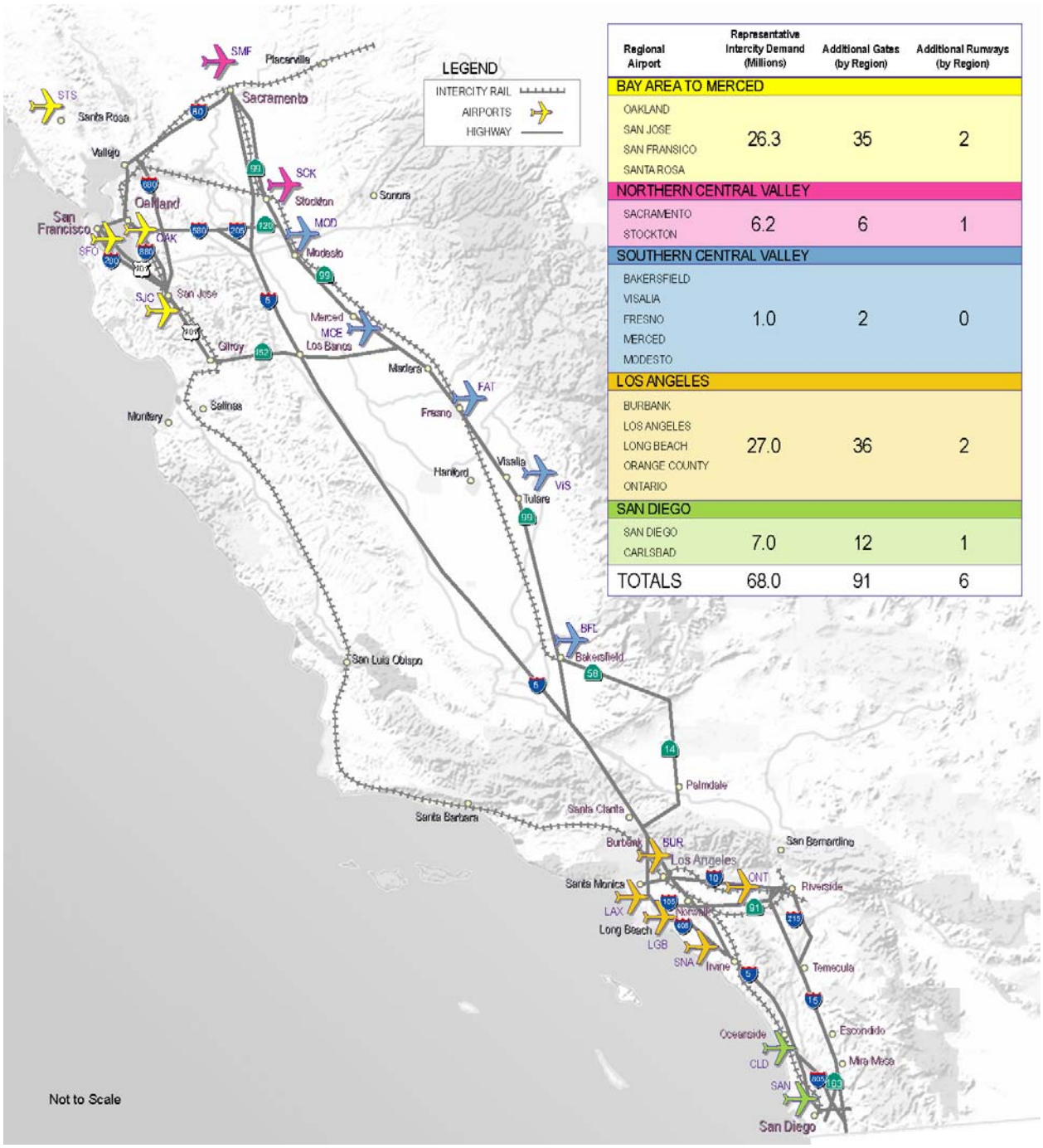
The High-Speed Train (HST) Alternative includes several corridor and station options. A steel-wheel on steel-rail, electrified train, primarily on exclusive right-of-way with small portions of the route on shared track with other rail is planned. Conventional "non-electric" improvements are also being considered along the existing LOSSAN rail corridor from Los Angeles to San Diego. The train track would be either at-grade, in an open trench or tunnel, or on an elevated guideway, depending on terrain and physical constraints.

For purposes of comparative analysis the HST corridors will be described from station-to-station within each region, except where a by-pass option is considered when the point of departure from the corridor will define the end of the corridor segment. The corridors and design options for HST for this region are shown on plans and profiles drawn on aerial photos in Appendix C.

Figure 1.1-1
No-Project Alternative - California Transportation System

Figure 1.1-2
Modal Alternative - Highway Component

Figure 1.1-3
Modal Alternative - Aviation Component



Regional Airport	Representative Intercity Demand (Millions)	Additional Gates (by Region)	Additional Runways (by Region)
BAY AREA TO MERCED			
OAKLAND SAN JOSE SAN FRANSICO SANTA ROSA	26.3	35	2
NORTHERN CENTRAL VALLEY			
SACRAMENTO STOCKTON	6.2	6	1
SOUTHERN CENTRAL VALLEY			
BAKERSFIELD VISALIA FRESNO MERCED MODESTO	1.0	2	0
LOS ANGELES			
BURBANK LOS ANGELES LONG BEACH ORANGE COUNTY ONTARIO	27.0	36	2
SAN DIEGO			
SAN DIEGO CARLSBAD	7.0	12	1
TOTALS	68.0	91	6

2.0 BASELINE/AFFECTED ENVIRONMENT

2.1 STUDY AREA

The Alignments for the High Speed Train and its alternatives extend from the Sacramento and the San Francisco Bay Area, through the Central Valley to Los Angeles and San Diego. This report analyzes the region traversed by the alignments from Bakersfield to Los Angeles. Alignments in this region pass through the cities and communities of Bakersfield, Tehachapi, Mojave, Rosamond, Lancaster, Palmdale, Santa Clarita, San Fernando, Burbank, Glendale, City of Los Angeles, Vernon as well as unincorporated areas of Kern County and Los Angeles County.

The Study Area for hydrology and water quality is defined as: (1) a 100-foot buffer from the centerline of the High-Speed Train Alternative's proposed alignments and the direct footprint of new station facilities, including a 100-foot buffer from new station facilities; and (2) a 100-foot buffer from the Modal Alternative's direct corridor footprint and/or direct footprint of facilities, including corridors and facilities that would undergo upgrades/expansions.

2.2 REGULATORY ENVIRONMENT

2.2.1 Federal Regulations

Clean Water Act of 1977 and 1987

The purpose of the Clean Water Act (CWA) is to restore and maintain the chemical, physical, and biological integrity of the nation's waters through prevention, and elimination of pollution. It's applicable to any discharge of a pollutant into waters of the United States. Key sections of the CWA include:

1. Section 404 permit for dredge or fill materials from U.S. Army Corps of Engineers.
2. Section 402 permits (National Pollutant Discharge Elimination System [NPDES] permit) for all other discharges are obtained from U.S. Environmental Protection Agency (EPA) or appropriate state agency, which in most cases in the appropriate Regional Water Quality Control Board (RWQCB).
3. Section 401 water quality certification is required from the appropriate RWQCBs.
4. All projects must be consistent with the state Non-point Source Pollution Management Program (Section 319).

Section 401 (33 U.S.C. 1341 and 40 CFR 121): Section 401 of the CWA requires a water quality certification from the State Water Resources Control Board (SWRCB) or RWQCBs when a project:

1. Requires a federal license or permit (a Section 404 permit is the most common federal permit for highway or rail projects), and
2. Will result in a discharge to waters of the United States. Such certification may be conditioned. Project activities that typically result in a discharge subject to Section 401 water quality certification are the construction and subsequent operation of a facility.

The SWRCB revised the state regulations for the 401 Water Quality Certification Program. These revisions went into effect on June 24, 2000. The likelihood of a passive waiver has been reduced by the revised regulations that certification must be issued or denied before any federal deadline.

Section 402 (33 U.S.C. 1342 and 40 CFR 122): This section of the CWA establishes a permitting system for the discharge of any pollutant (except dredge or fill material) into waters of the United States. A National Pollutant Discharge Elimination System (NPDES) permit is required for all point discharges of

pollutants to surface waters. A point source is a discernible, confined, and discrete conveyance, such as by pipe, ditch, or channel.

Section 404 (33 U.S.C. 1344, 33 CFR Part 323, and 40 CFR Part 230): Section 404 of the CWA establishes a permit program administered by the U.S. Army Corps of Engineers (ACOE), which regulates the discharge of, dredged or fill material into waters of the United States (including wetlands). The Section 404(b) (1) guidelines allow the discharge of dredged or fill material into the aquatic system only if there is no practicable alternative that would have less adverse impacts.

Wild and Scenic Rivers Act of 1968, as Amended
(16 U.S.C. 1271-1287; 36 CFR251, 297; 43 CFR 8350)

The purpose of the Wild and Scenic Rivers Act is to preserve and protect wild and scenic rivers and immediate environments for benefit of present and future generations. It is applicable to all projects which affect designated wild, scenic, and recreational rivers and immediate environment and rivers under study for inclusion into the system. The Act prohibits federal agencies from undertaking activities that would adversely affect the values for which the river was designated. The Act is administered by a variety of state and federal agencies. Designated river segments flowing through federally managed lands are administered by the land-managing agency (e.g., U.S. Forest Service, Bureau of Land Management and the National Park Service). River segments flowing through private lands are administered by the state in conjunction with local government agencies. On projects that affect designated rivers or their immediate environments, consultation will occur through the NEPA process between the state lead agency and the land-managing agencies.

Safe Drinking Water Act of 1944, as Amended (42 U.S.C. 300[f])

The purpose of the Safe Drinking Water Act is to ensure public health and welfare through safe drinking water. The Act is applicable to all public drinking water systems and reservoirs (including rest area facilities). It is also applicable to actions that may have a significant impact on an aquifer or wellhead protection area that is the sole or principal drinking water. This act requires coordination with EPA when an area designated as a principal or sole source aquifer may be impacted by a proposed project. In California, the EPA has designated the following as sole source aquifers: Campo-Cottonwood, Fresno, Ocotillo-Coyote Wells, Santa Margarita, and Scotts Valley.

Executive Order 11988 – Floodplain Management
(U.S. DOT Order 5650.2; 23 CFR 650, Subpart A)

Executive Order 11988 directs all federal agencies to avoid all short-term and long-term adverse impacts associated with floodplain modification and to avoid direct and indirect support of development within 100-year lakes whenever there is a reasonable alternative available.

Projects that encroach upon 100-year lakes must be supported with additional specific information. The U.S. Department of Transportation Order 5650.2, titled "Floodplain Management and Protection," prescribes "policies and procedures for ensuring that proper consideration is given to the avoidance and mitigation of adverse floodplain impacts in agency actions, planning programs and budget requests." The order does not apply to areas with Zone C (areas of minimal flooding as shown on Federal Emergency Management Agency [FEMA] Flood Insurance Rate Maps [FIRM]). The order requires that attention be given and findings made in environmental review documents indicating any risks, impacts, and support from the proposed transportation facility.

Flood Disaster Protection Act
(42 U.S.C. 4001-4128; DOT Order 5650.2, 23 CFR 650 Subpart A; and 23 CFR 771)

The purpose of the Flood Disaster Protection Act is to identify flood-prone areas and provide insurance. The Act requires purchase of insurance for buildings in special flood-hazard areas. The Act is applicable

to any federally assisted acquisition or construction project in an area identified as having special flood hazards. Projects should avoid construction in, or develop a design to be consistent with, FEMA-identified flood-hazard areas.

2.2.2 State Regulations

California Department of Fish and Game (Sections 1601-1603 [Streambed Alteration])

Under Sections 1601-1603 of the Fish and Game Code, agencies are required to notify the California Department of Fish and Game (CDFG) prior to any project which would divert, obstruct or change the natural flow or bed, channel or bank of any river, stream or lake. Preliminary notification and project review generally occurs during the environmental process. When an existing fish or wildlife resource may be substantially adversely affected, the CDFG is required to propose reasonable project changes to protect the resource. These modifications are formalized in a "streambed alteration agreement" which becomes part of the plans, specifications and bid documents for a project.

Porter-Cologne Water Quality Act (Water Code sections 13000 et seq.)

The Porter-Cologne Act is the basic water quality control law for California. The act is implemented by the SWRCB and the nine RWQCBs. The boards implement the permit provisions (Section 402), certain planning provisions (sections 205, 208, and 303 of the federal CWA). This means that the state issues one discharge permit for purposes of both state and federal law. Under state law, the permit is officially called waste discharge requirement. Under federal law, the permit is officially called a NPDES permit. The Porter-Cologne Act requires that anyone who is discharging waste or proposing to discharge waste that could affect the quality of the state's water must file a "report of waste discharge" with that RWQCB.

2.2.3 Other Regulations

The Bakersfield to Los Angeles segment of the project is covered by two Regional Water Quality Control Boards (RWQCB). They are the Los Angeles Water Quality Board (LAWQCB) and the Central Valley Water Quality Control Board (CVWQCB). The LAWQCB covers Los Angeles County and Ventura County and has these segments within its district; Antelope Valley, Burbank Airport to Downtown, East Connection, I-5: Glendale, I-5: Silverlake Aerial/Cut and Cover Option, LAUS East Bank: North, East & South, Metrolink/UPRR: All, Soledad Canyon, and South Connection. The CVWQCB covers Kern County and has these segments within its district; I-5: Tehachapi, Sr-58, Soledad Canyon, Union Avenue, and Wheeler Ridge Corridors

LAWQCB has adopted the Standard Urban Storm Water Mitigation Plan (SUSMP) for new construction. The municipal storm water National Pollutant Discharge Elimination System (NPDES) permit (Los Angeles County Permit) issued to Los Angeles County and 85 cities (Permittees) by the Los Angeles Regional Water Quality Control Board (Regional Board) on July 15, 1996, requires the development and implementation of a program addressing storm water pollution issues in development planning for private projects.

The requirement to implement a program for development planning is based on, federal and state statutes including: Section 402 (p) of the Clean Water Act, Section 6217 of the Coastal Zone Act Reauthorization Amendments of 1990 ("CZARA"), and the California Water Code. The Clean Water Act amendments of 1987 established a framework for regulating storm water discharges from municipal, industrial, and construction activities under the NPDES program. The primary objectives of the municipal storm water program requirements are to:

1. Effectively prohibit non-storm water discharges, and
2. Reduce the discharge of pollutants from storm water conveyance systems to the Maximum Extent Practicable (MEP statutory standard).

The Standard Urban Storm Water Mitigation Plan (SUSMP) was developed as part of the municipal storm water program to address storm water pollution from new Development and Redevelopment by the private sector. This SUSMP contains a list of the minimum required Best Management Practices (BMPs) that must be used for a designated project. Additional BMPs may be required by ordinance or code adopted by the Permittee and applied generally or on a case by case basis. The Permittees are required to adopt the requirements set herein in their own SUSMP. Developers must incorporate appropriate SUSMP requirements into their project plans. Each Permittee will approve the project plan as part of the development plan approval process and prior to issuing building and grading permits for the projects covered by the SUSMP requirements.

All projects that fall into one of seven categories are identified in the Los Angeles County MS4 Permit as requiring SUSMPs. These categories are:

- Single-Family Hillside Residences
- 100,000 Square Foot Commercial Developments
- Automotive Repair Shops
- Retail Gasoline Outlets
- Restaurants
- Home Subdivisions with 10 to 99 housing units
- Home Subdivisions with 100 or more housing units

The Regional Board Executive Officer has designated two additional categories subject to SUSMP requirements for the Los Angeles County MS4 Permit. These categories are:

- Location within or directly adjacent to or discharging directly to an environmentally sensitive area, and
- Parking lots 5,000 square feet or more or with 25 or more parking spaces and potentially exposed to storm water runoff

HST is under the guidelines of the SUSMP because in all alternatives it creates more than 5,000 square feet of impervious surface for parking.

2.3 BASELINE / AFFECTED ENVIRONMENT

There are a number of hydrology/water quality resources in the study area of the HST and Modal Alternatives. These hydrology/water quality resources are lakes, groundwater, streams, erodible soils and lakes. A description of the resource and acreage within the study area are listed within Table 2.3-1 and described in this Section.

2.3.1 Lakes

As listed in Table 2.3-1, due to the lack of roadway improvements occurring for the No-Project Alternative, no hydrologic/water quality resources were identified as impacted. The only roadway improvement for this alternative would occur at SR-58/14: SR-99 to Palmdale where high occupancy vehicle (HOV) lanes would be created within the existing right of way. It is anticipated that these HOV lanes could be accommodated within the existing median. Lakes have been identified in more than half of the segments under the Modal Alternative. The majority of the lakes occurring within the Modal

Alternative are located in the I-5: SR-99 to SR-14 segment. For the HST Alternative, the majority of acreage of lakes occurs along undeveloped portions of the SR-58/Antelope Valley and I-5/Grapevine routes.

2.3.2 Streams

As listed in Table 2.3-1, due to the lack of roadway improvements occurring for the No-Project Alternative, no river/stream resources were identified as impacted. The only roadway improvement for this alternative would occur at SR-58/14: SR-99 to Palmdale where high occupancy vehicle (HOV) lanes would be created within the existing right of way in the Antelope Valley. It is anticipated that these HOV lanes could be accommodated within the existing median. The length of the rivers/streams occurring within the study area have been identified. The majority of the rivers/streams occurring within the Modal Alternative are located in the I-5: SR-99 to SR-14 segment. For the HST Alternative, the majority of acreage of lakes occurs along undeveloped portions of the SR-58/Antelope Valley and I-5/Grapevine routes.

2.3.3 Erosion

Soils prone to erosion have been identified based on the Methodology described in Section 3. The acreage of erodible soil is presented in Table 2.3-1. Due to the lack of roadway improvements occurring for the No-Project Alternative, no soils resources were identified as impacted. The only roadway improvement for this alternative would occur at SR-58/14: SR-99 to Palmdale where high occupancy vehicle (HOV) lanes would be created within the existing right of way of the SR-14 in the Antelope Valley. It is anticipated that these HOV lanes could be accommodated within the existing median. The majority of the erodible soils occurring within the Modal Alternative are located in the I-5: SR-99 to SR-14 segment. For the HST Alternative, the majority of acreage of erodible soils occurs along undeveloped portions of the SR-58/Antelope Valley and I-5/Grapevine routes.

2.3.4 Groundwater

The HST alignments cross three regional aquifers listed as follows; Basin and Range aquifers, California Coastal Basin aquifers, and Central Valley aquifer system. The depth of these aquifers varies by location. Further analysis will be performed to determine the impacts to these aquifers under the Tier 2 analyses. As listed in Table 2.3-1, due to the lack of roadway improvements occurring for the No-Project Alternative, no erodible soil resources were identified as impacted. The only roadway improvement for this alternative would occur along the SR-58/14: SR-99 to Palmdale where high occupancy vehicle (HOV) lanes would be created within the existing right of way on SR-14 in Antelope Valley. It is anticipated that these HOV lanes could be accommodated within the existing median.

Table 2.3-1
Summary of Affected Area for
Hydrology and Water Quality
Bakersfield to Los Angeles

	Floodplains (acres)	Groundwater (acres)	Rivers/ Streams Crossed (length)	Erodible Soils (acres)	Lakes (acres)
NO-PROJECT					
Highways					
I-5: SR-99 to SR-14 (no programmed improvements)	0	0	0	0	0
I-5: SR-14 to I-405 (no programmed improvements)	0	0	0	0	0
I-5: I-405 to Burbank (no programmed improvements)	0	0	0	0	0
I-5: Burbank to LA Union Station (no programmed improvements)	0	0	0	0	0
SR-58/14: SR-99 to Palmdale(programmed widening in Antelope Valley done in existing ROW)	0	0	0	0	0
SR-14: Palmdale to I-5 (no programmed improvements)	0	0	0	0	0
Airports	0	0	0	0	0
Burbank (no Change)	0	0	0	0	0
MODAL					
Highways					
I-5: SR-99 to SR-14 (Widen 2 lanes)	76	415	28364	1559	14
I-5: SR-14 to I-405 (Double-deck 4 lanes)	0	36	1673	61	1
I-5: I-405 to Burbank (Widen 4 lanes)	14	358	2799	371	1
I-5: Burbank to LA Union Station (Widen 4 lanes)	2	89	499	181	0
SR-58/14: SR-99 to Palmdale (No widening)	0	0	0	0	0
SR-14: Palmdale to I-5 (Widen 2 lanes)	33	378	13027	844	16
Airports					
Burbank (9.9 additional MAP, 19 new gates, 1 new runway, 1 new access)	0	1387	0	1387	0
Route Total	126 (H)	2662 (H)	46312 (H)	5338 (H)	31.6 (H)

	Floodplains (acres)	Groundwater (acres)	Rivers/ Streams Crossed (length)	Erodible Soils (acres)	Lakes (acres)
HST CORRIDOR & STATION OPTIONS					
Bakersfield-Los Angeles					
Alignments					
Antelope Valley Corridor	148	431	1280	431	0
Burbank Airport to Downtown	0	8	0	8	0
East Connection	0	38	0	41	0
I-5: Tehachapi Corridor	135	349	22344	1356	18
I-5: Glendale	10	50	815	100	0
I-5: Silverlake Aerial/Cut and Cover Option	0	43	0	92	0
LAUS East Bank: North	0	27	1650	27	0
LAUS Existing: East	0	26	318	26	0
LAUS Existing: South	0	0	420	12	0
Metrolink/UPRR: Glendale	0	73	0	73	0
Metrolink/UPRR: Over I-5 and SR-110	0	67	1524	67	0
Metrolink/UPRR: Over and Under I-5 and SR-110	0	32	0	32	0
Metrolink/UPRR: Sylmar Station North	0	4	250	4	0
Metrolink/UPRR: Sylmar Station to Metrolink	0	72	200	72	0
Metrolink/UPRR: Under I-5 and SR-110	0	69	1558	69	0
SR-58 Corridor	76	597	29399	1327	0
Soledad Canyon Corridor	93	330	26647	835	0
South Connection		52	0	52	0
Union Avenue Corridor	28	711	8147	659	0
Wheeler Ridge Corridor	273	695	3019	667	0
Stations (including station approach tracks)					
Burbank Airport Siding	1	120	0	120	0
Burbank Downtown Siding	4	44	1384	44	0
I-5: Burbank Downtown Siding	1	30	0	30	0
LAUS East Bank Siding	0	17	487	17	0
LAUS Existing Siding	0	18	0	18	0
LAUS South Siding	0	0	200	34	0
Maintenance Yard	0	11	1038	332	0
Metrolink/UPRR: Burbank Downtown Siding	0	62	201	62	0
Metrolink/UPRR: Sylmar Station Siding	0	75	200	75	0
Palmdale Siding	0	76	6586	76	0
HST Routing Totals					
Bakersfield to Sylmar					
Union Avenue Corridor	28	711	8147	659	0
I-5: Tehachapi Corridor	135	349	22344	1356	18
Total	**163**	**1060**	**30491**	**2015**	**18**
Wheeler Ridge Corridor	273	695	3019	667	0
I-5: Tehachapi Corridor	135	349	22344	1356	18

	Floodplains (acres)	Groundwater (acres)	Rivers/ Streams Crossed (length)	Erodible Soils (acres)	Lakes (acres)
Total	408	1044	25363	2023	18
SR-58 Corridor	76	597	29399	1327	0
Soledad Canyon Corridor	93	330	26647	835	0
Palmdale Siding	0	76	6586	76	0
Antelope Valley Corridor	148	431	1280	431	0
Total	**317**	**1434**	**63912**	**2669**	**0**
Sylmar to Downtown Burbank					
Metrolink/UPRR: Sylmar Station North	0	4	250	4	0
Metrolink/UPRR: Sylmar Station to Metrolink	0	72	200	72	0
Metrolink/UPRR: Sylmar Station Siding	0	75	200	75	0
Burbank Airport to Downtown	0	8	0	8	0
Burbank Airport Siding	1	120	0	120	0
Burbank Downtown Siding	4	44	1384	44	0
Total	**5**	**323**	**2034**	**323**	**0**
Downtown Burbank to Los Angeles					
I-5: Burbank Downtown Siding	1	30	0	30	0
I-5: Glendale	10	50	815	100	0
I-5: Silverlake Aerial/Cut and Cover Option	0	43	0	92	0
Total	**11**	**123**	**815**	**222**	**0**
Metrolink/UPRR: Burbank Downtown Siding	0	62	201	62	0
Metrolink/UPRR: Glendale	0	73	0	73	0
Metrolink/UPRR: Over and Under I-5 and SR-110	0	32	0	32	0
Metrolink/UPRR: Under I-5 and SR-110	0	69	1558	69	0
Total	**0**	**236**	**1759**	**236**	**0**
Metrolink/UPRR: Burbank Downtown Siding	0	62	201	62	0
Metrolink/UPRR: Glendale	0	73	0	73	0
Metrolink/UPRR: Over and Under I-5 and SR-110	0	32	0	32	0
Metrolink/UPRR: Over I-5 and SR-110	0	67	1524	67	0
Total	**0**	**234**	**1725**	**234**	**0**
LAUS Existing Siding	0	18	0	18	0
LAUS Existing: South	0	0	420	12	0
South Connection	0	52	0	52	0
Maintenance Yard	0	11	1038	332	0
Total	**0**	**81**	**1458**	**414**	**0**
LAUS Existing Siding	0	18	0	18	0
LAUS Existing: East	0	26	318	26	0
East Connection	0	38	0	41	0
Maintenance Yard	0	11	1038	332	0
Total	**0**	**93**	**1356**	**417**	**0**

	Floodplains (acres)	Groundwater (acres)	Rivers/ Streams Crossed (length)	Erodible Soils (acres)	Lakes (acres)
LAUS South Siding	0	0	200	34	0
LAUS Existing: East	0	26	318	26	0
East Connection	0	38	0	41	0
Maintenance Yard	0	11	1038	332	0
Total	**0**	**75**	**1556**	**433**	**0**
LAUS East Bank: North	0	27	1650	27	0
LAUS East Bank Siding	0	17	487	17	0
South Connection	0	52	0	52	0
Maintenance Yard	0	11	1038	332	0
Total	**0**	**107**	**3175**	**428**	**0**

Source: P&D Environmental, March 2003.

3.0 METHODOLOGY FOR IMPACT EVALUATION

The methodology employed for impact evaluation consists of a combination of both qualitative and quantitative assessment. A qualitative assessment was used for general comparisons of the three alternatives, on a segment-by-segment basis, when discussing issues such as runoff rates, sedimentation or other items that require a more detailed approach than what is warranted for this document. Based on each alternative, general conclusions are generated to support the relative change in impact between the alternatives. The No-Project Alternative is the primary basis of comparison. The impacts as a result of the Modal and High-speed Train Alternatives would be characterized as High, Medium or Low as compared to the No-Project Alternative.

A high impact to hydrology and/or water quality would generally be defined as the following:

- Proposed project will result in a substantial encroachment on a floodplain as defined in Executive Order 11998 for Floodplain Management (40 CFR 6.302[a]), or is located in a 100-year floodplain without adequate mitigation measures.
- Proposed project will result in violations of federal, state, or local water quality standards, or will contribute to violation when evaluated cumulatively with other projects in the region.
- Provisions to prevent contamination of surface waters and/or aquifers are not adopted as a part of the proposed project.
- Proposed project will result in substantial alteration in hydrology, including increased stormwater runoff, or increased groundwater discharge or reduction of groundwater recharge.

For medium or low impacts, the results are proportionately less for the hydrology and water quality information presented above. Additional potential impacts to hydrology and water quality include increased/decreased runoff and stormwater discharge from alteration in the amount of paved surfaces, increased or decreased contribution of automotive-based non-point source contamination, impacts on areas of groundwater discharge or infiltration.

For the quantitative assessment, readily available information such as wetland areas, stream locations, impacts on areas with existing water quality problems, flood zones, and soil information is used to assess the magnitude of the impact. For the purposes of this analysis, the study area is defined to include the following: (1) for the High-speed Train Alternative, direct corridors proposed for alternative alignments, including up to a 100-foot buffer from the corridors, the direct footprint of new station facilities, including a 100-foot buffer from new station facilities; and (2) for the Modal Alternative, direct corridors for facilities which would undergo upgrades, including up to a 100-foot buffer from the upgraded facilities.

To evaluate the quantitative impacts to water quality from the proposed High-Speed Train and Modal alternatives, the following was conducted:

- The acreage of lakes defined as Special Flood Hazard Areas (SFHAs) (as defined by the FEMA on FIRMs) within the study area was determined.
- The acreage of surface waters (lakes) or linear feet (rivers or streams) within the study area was determined. Surface waters are defined as lakes, rivers, and streams as identified on U.S. Geological Survey (USGS) 1:24,000 scale digital line graphs (DLGs). The linear feet of surface water was calculated based on the flow-path length of rivers and streams within the study area. Lake surface areas represent the impoundment at maximum capacity.
- The location of impaired waters defined as waters identified on the CWA 303(d) list (as distributed by the SWRCB) within the study area was determined.

- The location of potential erosive conditions was identified as those areas with a combination of erosive soils and high slopes, evaluated as the product of "kfact" and "slopeh" (listed in the STATSGO database). Those conditions where "kfact" x "slopeh" is greater than 3.0 are potentially susceptible to erosion, and acreage of these areas within the study area was determined.

For the purposes of comparing potential impacts between alternatives, the following definitions of high, medium and low impacts were used.

Floodplain Impacts:

High	101 and greater acres of floodplain within the study area
Medium	51 to 100 acres of floodplain within the study area
Low	1 to 50 acres of floodplain within the study area

Groundwater Impacts:

High	401 acres or more of groundwater basin within the study area
Medium	201 to 400 acres of groundwater basin within the study area
Low	1 to 200 acres of groundwater basin within the study area

Rivers/Stream Impacts:

High	2001 linear feet or more of rivers/streams crossed in the study area
Medium	1001 to 2000 linear feet of rivers/streams crossed in the study area
Low	1 to 1001 linear feet of rivers/streams crossed within the study area

Erosion Impacts:

High	5,001 acres or more of erodable soil in the study area
Medium	1001 to 5,000 acres of erodable soil in the study area
Low	1 to 1000 acres of erodable soil within the study area

Lake Impacts:

High	11 acres or more of lakes in the study area
Medium	6 to 10 acres of lakes in the study area
Low	1 to 5 acres of lakes within the study area

4.0 HYDROLOGY AND WATER QUALITY IMPACTS

4.1 Comparison of the No-Project, Modal and HST Alternatives

4.1.1 Floodplains

The No-Project Alternative presents the least amount of potential floodplain to be affected by the three Alternatives due to the only programmed development occurring on the SR-58/14 between SR-99 and Palmdale, this is limited to widening of a short segment of the SR-14 in the Antelope Valley. This programmed improvement is anticipated to occur within the existing roadway right-of-way.

The Modal Alternative would generally result in a substantially lower amount of floodplain area affected (126 acres) compared to the HST Alternative that affects 168 to 424 acres. The Modal Alternative has less acreage of floodplain within the study area and therefore is considered to have less of a potential impact than the HST alternative. As such the HST Alternative has the highest potential for adverse impacts to floodplain.

4.1.2 Groundwater

The No-Project Alternative presents the least amount of potential for groundwater aquifers to be affected by the three Alternatives due to the only programmed development occurring on a short segment of SR-14 on the SR-58/14 route between SR-99 and Palmdale. This programmed improvement is anticipated to occur within the existing roadway right-of-way which is not anticipated to involve additional effects on groundwater resources.

The Modal Alternative has 2,662 acres of groundwater aquifers within the study area of this Alternative. The HST Alternative would have between 1,565 to 2,100 acres of groundwater aquifers within the study area. The level of impacts HST Alternatives to groundwater aquifers is therefore anticipated to be less than the Modal Alternative.

4.1.3 Rivers and Streams

The No-Project Alternative presents the least amount of potential for rivers and streams to be affected by the three Alternatives due to the only programmed development occurring on a short segment of SR-14 on the SR-58/149 between the SR-99 and Palmdale. This programmed improvement is anticipated to occur within the existing roadway right-of-way and is not anticipated to involve additional effects on rivers and streams.

The Modal Alternative has 46,312 feet of streams and rivers within the study area. The HST Alternative would have between 29,568 to 70,880 feet of streams and rivers within the study area. As can be seen with the great range in variability of potential stream impacts for the HST, the level of impacts HST Alternatives is highly dependant on the routing of the HST. Use of the Antelope Valley route for the HST Alternative would result in the highest impact to rivers and streams. The least impact would result from the I-5 Grapevine routes for the HST.

4.1.4 Erodible Soils

The No-Project Alternative presents the least amount of potential for erodible soils to be affected by the three Alternatives due to the only programmed development occurring on a short segment of SR-14 on the SR-58/14 between SR-99 and Palmdale. This programmed improvement is anticipated to occur within the existing roadway right-of-way and is not anticipated to involve additional effects on erodible soils.

The Modal Alternative has 5,338 acres of erodible soils within the study area. The HST Alternative would have between 2,974 to 3,661 acres of erodible soils within the study area. Therefore, the HST

Alternative would result in less acreage of potentially disturbed erodible soils, between the Modal and HST Alternatives.

4.1.5 Lakes

The No-Project Alternative presents the least amount of potential for lakes to be affected by the three Alternatives due to the only programmed development occurring on a short segment of SR-14 on the SR-58/14 route between SR-99 and Palmdale. This programmed improvement is anticipated to occur within the existing roadway right-of-way and is not anticipated to involve effects on lakes.

The Modal Alternative has 31.6 acres of lakes within the study area. The HST Alternative would have between 18 acres of lakes within the study area. The HST Alternative would result in less acreage of lakes potentially disturbed within the study areas between the Modal and HST Alternatives.

Table 4.3-1

Summary
Hydrology and Water Quality Impacts
Bakersfield to Los Angeles

	Floodplains (acres)	Groundwater (acres)	Rivers/ Streams Crossed (length)	Erodible Soils (acres)	Lakes (acres)
NO-PROJECT					
Highways					
I-5: SR-99 to SR-14 (no programmed improvements)	0 (L)	0 (L)	0 (L)	0 (L)	0 (L)
I-5: SR-14 to I-405 (no programmed improvements)	0 (L)	0 (L)	0 (L)	0 (L)	0 (L)
I-5: I-405 to Burbank (no programmed improvements)	0 (L)	0 (L)	0 (L)	0 (L)	0 (L)
I-5: Burbank to LA Union Station (no programmed improvements)	0 (L)	0 (L)	0 (L)	0 (L)	0 (L)
SR-58/14: SR-99 to Palmdale(programmed widening in Antelope Valley done in existing ROW)	0 (L)	0 (L)	0 (L)	0 (L)	0 (L)
SR-14: Palmdale to SR-58 Route (no programmed improvements)	0 (L)	0 (L)	0 (L)	0 (L)	0 (L)
Airports	0 (L)	0 (L)	0 (L)	0 (L)	0 (L)
Burbank (no Change)	0 (L)	0 (L)	0 (L)	0 (L)	0 (L)
MODAL					
Highways					
I-5: SR-99 to SR-14 (Widen 2 lanes)	76 (M)	415 (H)	28364 (H)	1559 (M)	14 (H)
I-5: SR-14 to I-405 (Double-deck 4 lanes)	0 (L)	36 (L)	1673 (M)	61 (L)	1 (L)
I-5: I-405 to Burbank (Widen 4 lanes)	14 (L)	358 (M)	2799 (H)	371 (L)	1 (L)
I-5: Burbank to LA Union Station (Widen 4 lanes)	2 (L)	89 (L)	499 (L)	181 (L)	0 (L)
SR-58/14: SR-99 to Palmdale (No widening)	0 (L)	0 (L)	0 (L)	0 (L)	0 (L)
SR-14: Palmdale to I-5 (Widen 2 lanes)	33 (L)	378 (M)	13027 (H)	844 (L)	16 (H)
Airports					
Burbank (9.9 additional MAP, 19 new gates, 1 new runway, 1 new access)	0 (L)	1387 (H)	0 (L)	1387 (M)	0 (L)
Modal Route Total	126 (H)	2662 (H)	46312 (H)	5338 (H)	31.6 (H)

	Floodplains (acres)	Groundwater (acres)	Rivers/ Streams Crossed (length)	Erodible Soils (acres)	Lakes (acres)
HST CORRIDOR & STATION OPTIONS					
Bakersfield-Los Angeles					
Alignments					
Antelope Valley Corridor	148 (H)	431 (H)	1280 (M)	431 (L)	0 (L)
Burbank Airport to Downtown	0 (L)	8 (L)	0 (L)	8 (L)	0 (L)
East Connection	0 (L)	38 (L)	0 (L)	41 (L)	0 (L)
I-5: Tehachapi Corridor	135 (H)	349 (M)	22344 (H)	1356 (M)	18 (H)
I-5: Glendale	10 (L)	50 (L)	815	100 (L)	0 (L)
I-5: Silverlake Aerial/Cut and Cover Option	0 (L)	43 (L)	0 (L)	92 (L)	0 (L)
LAUS East Bank: North	0 (L)	27 (L)	1650 (M)	27 (L)	0 (L)
LAUS Existing: East	0 (L)	26 (L)	318	26 (L)	0 (L)
LAUS Existing: South	0 (L)	0	420	12 (L)	0 (L)
Metrolink/UPRR: Glendale	0 (L)	73 (L)	0 (L)	73 (L)	0 (L)
Metrolink/UPRR: Over I-5 and SR-110	0 (L)	67 (L)	1524 (M)	67 (L)	0 (L)
Metrolink/UPRR: Over and Under I-5 and SR-110	0 (L)	32 (L)	0 (L)	32 (L)	0 (L)
Metrolink/UPRR: Sylmar Station North	0 (L)	4 (L)	250 (L)	4 (L)	0 (L)
Metrolink/UPRR: Sylmar Station to Metrolink	0 (L)	72 (L)	200 (L)	72 (L)	0 (L)
Metrolink/UPRR: Under I-5 and SR-110	0 (L)	69 (L)	1558 (M)	69 (L)	0 (L)
SR-58 Corridor	76 (M)	597 (H)	29399 (H)	1327 (M)	0 (L)
Soledad Canyon Corridor	93 (M)	330 (M)	26647 (H)	835 (L)	0 (L)
South Connection	0 (L)	52 (L)	0 (L)	52 (L)	0 (L)
Union Avenue Corridor	28 (L)	711 (H)	8147 (H)	659 (L)	0 (L)
Wheeler Ridge Corridor	273 (H)	695 (H)	3019 (H)	667 (L)	0 (L)
Stations (including station approach tracks)					0 (L)
Burbank Airport Siding	1 (L)	120 (L)	0 (L)	120 (L)	0 (L)
Burbank Downtown Siding	4 (L)	44 (L)	1384 (M)	44 (L)	0 (L)
I-5: Burbank Downtown Siding	1 (L)	30 (L)	0 (L)	30 (L)	0 (L)
LAUS East Bank Siding	0 (L)	17 (L)	487 (L)	17 (L)	0 (L)
LAUS Existing Siding	0 (L)	18 (L)	0 (L)	18 (L)	0 (L)
LAUS South Siding	0 (L)	0 (L)	200 (L)	34 (L)	0 (L)
Maintenance Yard	0 (L)	11 (L)	1038 (M)	332 (L)	0 (L)
Metrolink/UPRR: Burbank Downtown Siding	0 (L)	62 (L)	201 (L)	62 (L)	0 (L)
Metrolink/UPRR: Sylmar Station Siding	0 (L)	75 (L)	200 (L)	75 (L)	0 (L)
Palmdale Siding	0 (L)	76 (L)	6586 (H)	76 (L)	0 (L)
					0 (L)
HST Routing Totals					0 (L)
Bakersfield to Sylmar					
Union Avenue Corridor	28 (L)	711 (H)	8147 (H)	659 (L)	0 (L)
I-5: Tehachapi Corridor	135 (H)	349 (M)	22344 (H)	1356 (M)	18 (H)
Total	**163 (H)**	**1060 (H)**	**30491 (H)**	**2015 (M)**	**18 (H)**
Wheeler Ridge Corridor	273 (H)	695 (H)	3019 (H)	667 (L)	0 (L)
I-5: Tehachapi Corridor	135 (H)	349 (M)	22344 (H)	1356 (M)	18 (H)
Total	**408 (H)**	**1044 (H)**	**25363 (H)**	**2023 (M)**	**18 (H)**

	Floodplains (acres)	Groundwater (acres)	Rivers/ Streams Crossed (length)	Erodible Soils (acres)	Lakes (acres)
SR-58 Corridor	76 (M)	597 (H)	29399 (H)	1327 (M)	0 (L)
Soledad Canyon Corridor	93 (M)	330 (M)	26647 (H)	835 (L)	0 (L)
Palmdale Siding	0 (L)	76 (L)	6586 (H)	76 (L)	0 (L)
Antelope Valley Corridor	148 (H)	431 (H)	1280 (M)	431 (L)	0 (L)
Total	**317 (H)**	**1434 (H)**	**63912 (H)**	**2669 (M)**	**0 (L)**
Sylmar to Downtown Burbank					
Metrolink/UPRR: Sylmar Station North	0 (L)	4 (L)	250 (L)	4 (L)	0 (L)
Metrolink/UPRR: Sylmar Station to Metrolink	0 (L)	72 (L)	200 (L)	72 (L)	0 (L)
Metrolink/UPRR: Sylmar Station Siding	0 (L)	75 (L)	200 (L)	75 (L)	0 (L)
Burbank Airport to Downtown	0 (L)	8 (L)	0 (L)	8 (L)	0 (L)
Burbank Airport Siding	1 (L)	120 (L)	0 (L)	120 (L)	0 (L)
Burbank Downtown Siding	4 (L)	44 (L)	1384 (M)	44 (L)	0 (L)
Total	**5 (L)**	**323 (M)**	**2034 (H)**	**323 (L)**	**0 (L)**
Downtown Burbank to Los Angeles					
I-5: Burbank Downtown Siding	1 (L)	30 (L)	0 (L)	30 (L)	0 (L)
I-5: Glendale	10 (L)	50 (L)	815 (L)	100 (L)	0 (L)
I-5: Silverlake Aerial/Cut and Cover Option	0 (L)	43 (L)	0 (L)	92 (L)	0 (L)
Total	**11 (L)**	**123 (L)**	**815 (L)**	**222 (L)**	**0 (L)**
Metrolink/UPRR: Burbank Downtown Siding	0 (L)	62 (L)	201 (L)	62 (L)	0 (L)
Metrolink/UPRR: Glendale	0 (L)	73 (L)	0 (L)	73 (L)	0 (L)
Metrolink/UPRR: Over and Under I-5 and SR-110	0 (L)	32 (L)	0 (L)	32 (L)	0 (L)
Metrolink/UPRR: Under I-5 and SR-110	0 (L)	69 (L)	1558 (M)	69 (L)	0 (L)
Total	**0 (L)**	**236 (M)**	**1759 (M)**	**236 (L)**	**0 (L)**
Metrolink/UPRR: Burbank Downtown Siding	0 (L)	62 (L)	201 (L)	62 (L)	0 (L)
Metrolink/UPRR: Glendale	0 (L)	73 (L)	0 (L)	73 (L)	0 (L)
Metrolink/UPRR: Over and Under I-5 and SR-110	0 (L)	32 (L)	0 (L)	32 (L)	0 (L)
Metrolink/UPRR: Over I-5 and SR-110	0 (L)	67 (L)	1524 (M)	67 (L)	0 (L)
Total	**0 (L)**	**234 (M)**	**1725 (M)**	**234 (L)**	**0 (L)**
LAUS Existing Siding	0 (L)	18 (L)	0 (L)	18 (L)	0 (L)
LAUS Existing: South	0 (L)	0 (L)	420	12 (L)	0 (L)
South Connection	0 (L)	52 (L)	0 (L)	52 (L)	0 (L)
Maintenance Yard	0 (L)	11 (L)	1038 (M)	332 (L)	0 (L)
Total	**0 (L)**	**81 (L)**	**1458 (M)**	**414 (L)**	**0 (L)**
LAUS Existing Siding	0 (L)	18 (L)	0 (L)	18 (L)	0 (L)
LAUS Existing: East	0 (L)	26 (L)	318	26 (L)	0 (L)
East Connection	0 (L)	38 (L)	0 (L)	41 (L)	0 (L)
Maintenance Yard	0 (L)	11 (L)	1038 (M)	332 (L)	0 (L)
Total	**0 (L)**	**93 (L)**	**1356 (M)**	**417 (L)**	**0 (L)**
LAUS South Siding	0 (L)	0 (L)	200 (L)	34 (L)	0 (L)

	Floodplains (acres)	Groundwater (acres)	Rivers/ Streams Crossed (length)	Erodible Soils (acres)	Lakes (acres)
LAUS Existing: East	0 (L)	26 (L)	318	26 (L)	0 (L)
East Connection	0 (L)	38 (L)	0 (L)	41 (L)	0 (L)
Maintenance Yard	0 (L)	11 (L)	1038 (M)	332 (L)	0 (L)
Total	**0 (L)**	**75 (L)**	**1556 (M)**	**433 (L)**	**0 (L)**
LAUS East Bank: North	0 (L)	27 (L)	1650 (M)	27 (L)	0 (L)
LAUS East Bank Siding	0 (L)	17 (L)	487 (L)	17 (L)	0 (L)
South Connection	0 (L)	52 (L)	0 (L)	52 (L)	0 (L)
Maintenance Yard	0 (L)	11 (L)	1038 (M)	332 (L)	0 (L)
Total	**0 (L)**	**107 (L)**	**3175 (H)**	**428 (L)**	**0 (L)**

Source: P&D Environmental, March 2003.

5.0 REFERENCES

California Department of Transportation. *Standard Environmental Reference, Environmental Handbook Volume 1*. Accessed from website, http://www.dot.ca.gov/ser/vol1/vol1.htm. January 14, 2003.

Parsons-Brinckerhoff. *Screening Report.* Prepared for California High-Speed Rail Authority, April 2002.

Parsons-Brinckerhoff. *Plans and Profiles.* Prepared for California High-Speed Rail Authority, November 2002.

Parsons-Brinckerhoff. *Final Draft Environmental Analysis Methodologies*. Prepared for California High-Speed Rail Authority, November 7, 2002.

6.0 PREPARERS

Sylvia Salenius Senior Vice President	Master of City and Regional Planning; B.A. with Distinction in Political Science, B.A. with Distinction in Studio Arts, Phi Beta Kappa. American Institute of Certified Planners. 30 years of experience in CEQA/NEPA documentation, environmental analysis, urban and transportation planning and public participation. • Project Management
Ron Richardson Civil Engineer	BS Ciivil Engineering. 15 Years of Experience in Hydrology/Hydraulics • Hydrology/Water Quality Lead Analyst
Tin Cheung Senior Environmental Scientist	BA Geography/Environmental Studies. 10 Years of Experience in CEQA/NEPA documentation • Hydrology/Water Quality Analyst
Vaidas Sekas GIS Specialist	Education/Credentials. 6 Years of Experience in Geographic Information Systems (GIS) analyses. • GIS Specialist

Appendices

Appendix A
Modal Alternative
Floodplain Risk Assessment

Under the two modal alternatives there are 49-acres for the SR-58 route and 93-acres for the I-5 that are in the 100-year floodplain. Floodplain risk assessment is based on impacts to inhabitable structures. While the tracks maybe in the 100-year floodplain they are not inhabitable structures. The modal alternatives have no inhabitable structures; therefore there is no floodplain risk.

APPENDIX B
High-Speed Train Alternative
Floodplain Risk Assessment

Under the HST alternatives there are 178-acres for the SR-58 route and 418-acres for the I-5 that are in the 100-year floodplain. Floodplain risk assessment is based on impacts to inhabitable structures. While the tracks maybe in the 100-year floodplain they are not inhabitable structures. Of the ten stations only three stations are within the 100-year floodplain. The Burbank Airport Siding has 1-acre, Burbank Downtown Siding has 4-acres and the I-5: Burbank Downtown Siding has 1-acre. To mitigate the impacts of the 100-year floodplain the stations will be built at an elevation of one foot higher that the floodplain.